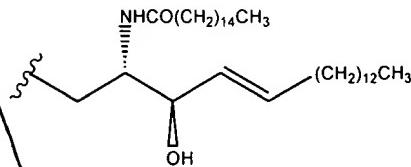


with the proviso that when R is the moiety having the structure:



the set of indices (r, m, n) is not (1, 0, 1).

117. The composition of claim 115 or 116 wherein the protein is bovine serum albumin, polylysine, or keyhole limpet hemocyanin.
118. The composition of claim 114 wherein the immunological adjuvant is bacteria or liposomes.
119. The composition of claim 118 wherein the adjuvant is *Salmonella minnesota* cells, bacille Calmette-Guerin or QS21.

#### REMARKS

Applicant respectfully requests entrance of the amendments as detailed above, and respectfully submits that no new matter is presented with these amendments.

#### *Amendments to the specification*

The specification has been amended to correct typographical errors or clerical errors in the chemical structures. For example, the ceramide moiety on pages 18, 49, 54 and 58 of the specification was amended to more particularly depict the points of attachment and to remove the oxygen atom at the point of attachment, since the O atom is already present on the carbohydrate constructs.

#### *Amendments to Formal Drawing*

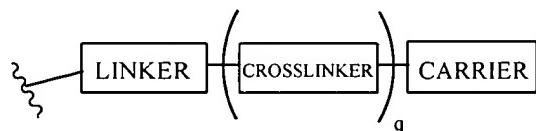
The formal drawings have been amended to correct typographical errors or clerical errors, as detailed in the enclosed letter entitled "Amendment to Formal Drawing".

***Addition of claims***

In an effort to present the claims in logical order, claims 1-74, 85-99 and 101-107 have been canceled, and replaced by newly added claims 108-119. The claims have been amended in order to more clearly set forth what is intended as Applicant's invention or to expedite prosecution. Specifically, Applicant would like to point out that claims 108-119 are directed to KH-1 constructs and pharmaceutical compositions thereof. Methods of inducing antibodies comprising administering to a subject a KH-1 construct of the invention were pursued in the parent case (USSN 09/042,280, now U.S. Patent No.: 6,238,668). In the present case, Applicant is pursuing claims to the inventive KH-1 constructs themselves.

Applicant notes that, in the parent case, the Examiner issued an office Action (dated August 18, 1999) requiring election between (i) a method of inducing antibodies directed to carbohydrate constructs having an N3 epitope; and (ii) a method of inducing antibodies directed to carbohydrate constructs having a KH-1 epitope. Applicant therefore anticipated that an analogous election requirement might be applied in the present case and has obviated any such requirement as to newly added claims 108-119, which recite carbohydrate constructs having a KH-1 epitope and pharmaceutical compositions thereof. Nonetheless, Applicant explicitly reserves the right to pursue the subject matter pertaining to the N3 carbohydrate constructs in continuation or divisional applications.

Applicant submits that these amendments are fully supported by the specification and that no new matter is added with these amendments and additions. Specifically, the KH-1 constructs recited in claims 108 and 110 find support throughout the specification, for example on pages 46-58 and in original method of treatment claims 75, 87, 94, 100 and pharmaceutical composition claim 101. In addition, newly added claim 110 includes a more specific description of the glycosaccharide-carrier linkage, as depicted below:



Support for the structure of the recited linkers can be found *inter alia* in original claim 1, and in Figures 12B and 13A-B. Support for the structure of the crosslinker (*e.g.*, M<sub>2</sub> crosslinker, formed upon the conjugation of 4-maleimidomethyl cyclohexane-1-carboxyl hydrazide with the linker) can be found on pages 86-90 and on Figures 13A and 13B. Finally, the recited elements for

the carrier system include protein, peptide, and lipid. Support for the protein- or peptide-carrier can be found *inter alia* in original claims 1 and 3, and throughout the specification. The lipid-carrier element finds support in the description of the Ceramide constructs (*e.g.*, a lipid-glycoconjugate) throughout the specification. In addition, lipid-glycoconjugates are also suggested on page 10 lines 14-30, which reads: "*The present invention provides new strategies and protocols for oligosaccharide synthesis. The object is to simplify such constructions such that relatively complex domains can be assembled with high stereospecificity. Major advances in glycoconjugate synthesis require the attainment of a high degree of convergence and relief from the burden associated with the manipulation of blocking groups. Another requirement is that of delivering the carbohydrate determinant with appropriate provision for conjugation to carrier proteins or lipids.* (*Bernstein, M.A., and Hall, L.D., Carbohydr. Res., 1980, 78, Cl; Lemieux, R.U., Chem. Soc. Rev., 1978, 7, 423; R.U. Lemieux, et al., J. Am. Chem. Soc., 1975, 97, 4076.*) *This is a critical condition if the synthetically derived carbohydrates are to be incorporated into carriers suitable for biological application.*" Additional support suggesting the conjugation of the glycosaccharides of the present invention to lipid carriers can be found on page 98 lines 7-13, which reads: "*These carbohydrates domains are encountered as cell-surface bound glycolipids or glycoproteins. Hakomori, S., Cancer Cells, 1991, 3, 461. It would be useful for cancer therapy to achieve some level of immune response by vaccinating cancer patients with such cell-free carbohydrate domains, obtained through total synthesis and suitably biocoujugated.*"

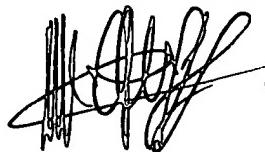
Claims 109 and 111 find support *inter alia* in original claims 102 and 103, respectively.

Claims 112 and 119 are drawn to a KH-1 allyl ether construct and find support in Figures 1 and 12A.

Claims 114-119 are pharmaceutical composition claims corresponding in scope to the compounds of claims 108-111, and find support in original claims 101-107 and throughout the specification (for example, on pages 55-61).

Applicant would like to thank the Examiner in advance for favorable review of this amendment. If it is believed that a telephone conversation would expedite matters, the Examiner is invited to contact the undersigned at (617) 248-5150. Although it is believed that there is no fee associated with this amendment, if Applicant is mistaken, please charge any fees to our Deposit Account No.: 03-1721.

Respectfully Submitted,



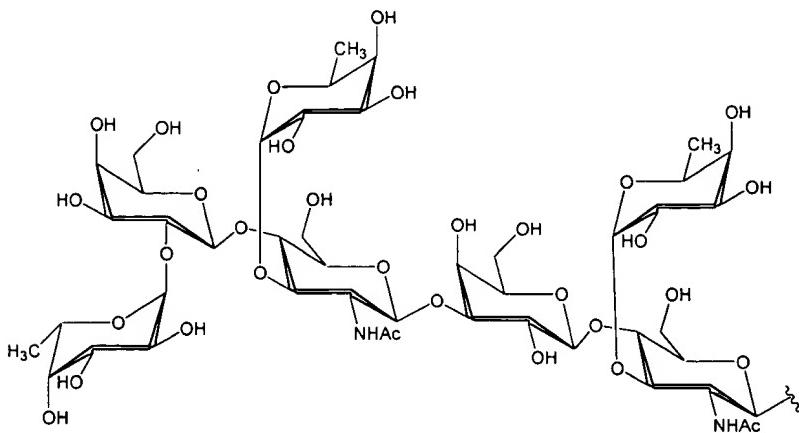
Nadège M. Lagneau, Ph.D.  
Reg. No.: P-51,908

Choate, Hall & Stewart  
Exchange Place  
53 State Street  
Boston, MA 02109  
(617) 248-5216  
Date: July 3, 2002

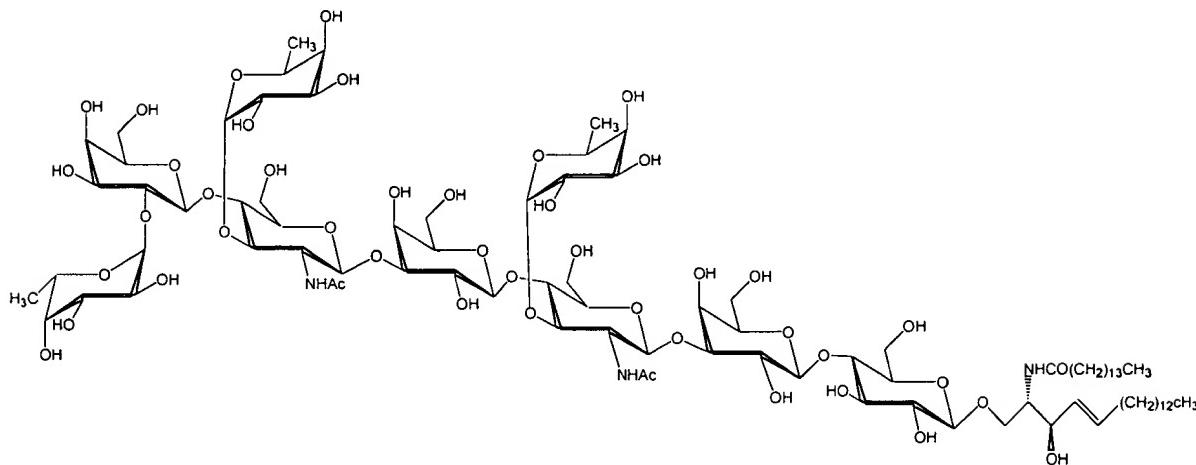
I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner For Patents, Washington, D.C. 20231 on July 3, 2002 Nadège Lagneau

Pending Claims (After Entry of Amendment)

108. A compound which contains a determinant having the structure:

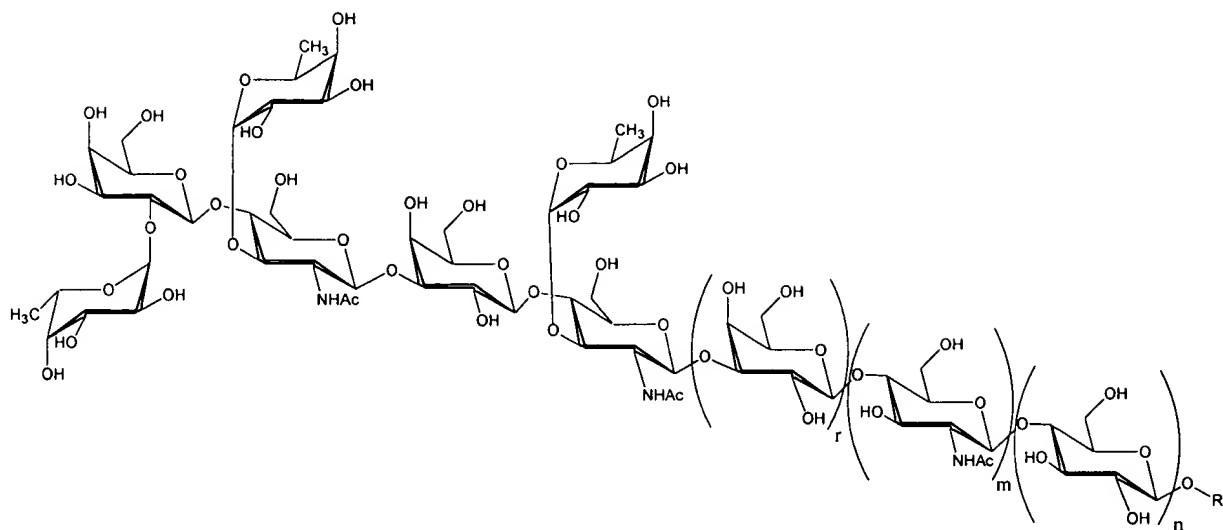


with the proviso that the compound does not have the structure:



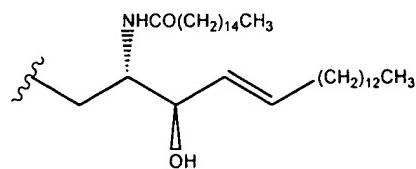
109. The compound of claim 108 wherein the compound is bound to a suitable carrier protein or lipid, said compound being bound either directly or by a cross-linker selected from the group consisting of a succinimide and an M<sub>2</sub> linker.

110. The compound of claim 108 wherein the compound has the structure:

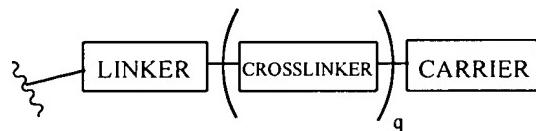


wherein r, m, and n are independently 0, 1, 2 or 3;

wherein R is H, substituted or unsubstituted alkyl, aryl or allyl, an amino acyl moiety, a moiety having the structure:



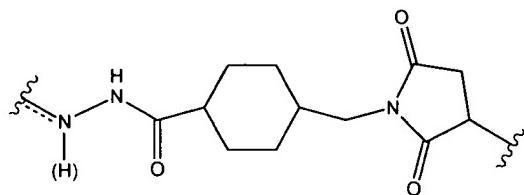
or a moiety having the structure:



wherein the linker is  $-(CH_2)_s-CH_2-$  or  $-(CH_2)_s-CH=$  where s is an integer between 0 and 8;

wherein the crosslinker is selected from the group consisting of a succinimide and an M<sub>2</sub>

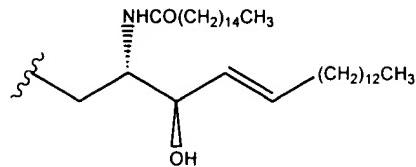
linker having the structure:



wherein q is 0 or 1;

and wherein the carrier is a protein, peptide or lipid, and is optionally chemically modified prior to conjugation with the linker when q is 0, or with the crosslinker when q is 1;

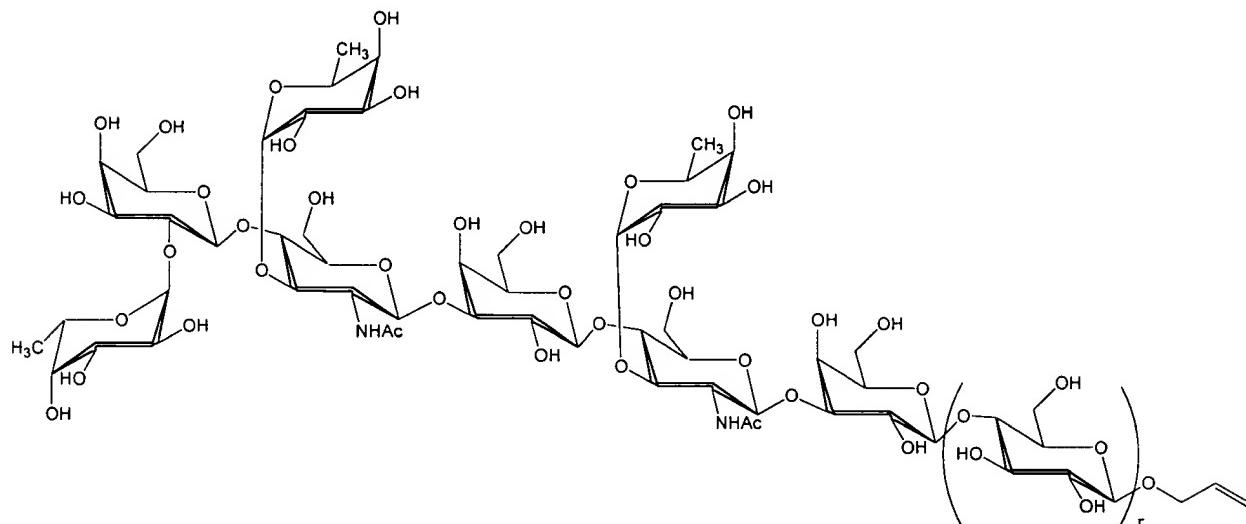
with the proviso that when R is the moiety having the structure:



the set of indices (r, m, n) is not (1, 0, 1).

111. The compound of claim 109 or 110 wherein the protein is bovine serum albumin, polylysine, or keyhole limpet hemocyanin.

112. A compound having the structure:



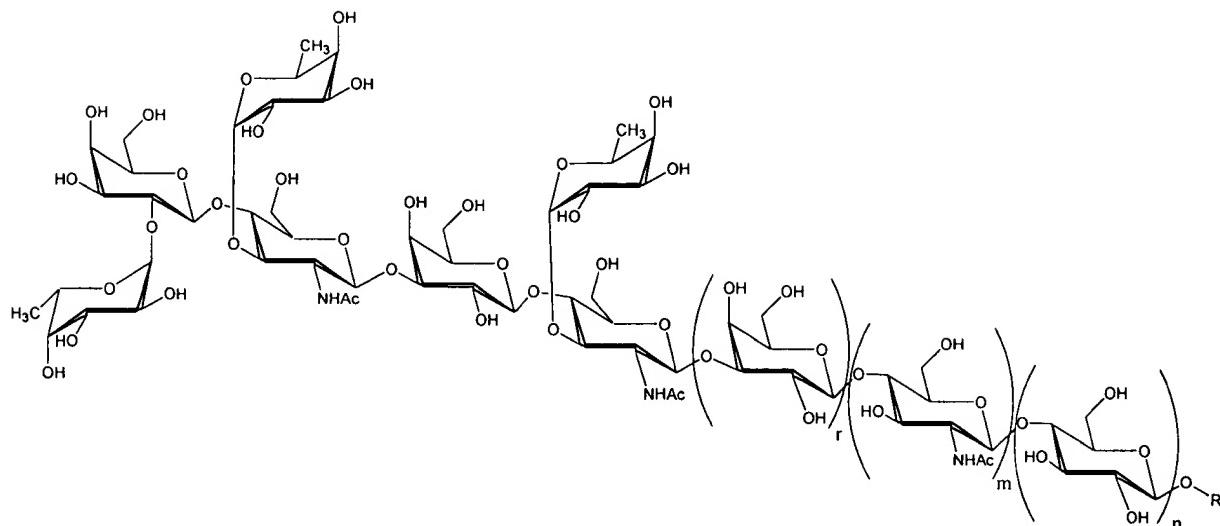
wherein r is 0, 1, 2, 3, or 4.

113. The compound of claim 112 wherein r is 1.

114. A composition comprising a compound of claim 108; and optionally an immunological adjuvant and/or a pharmaceutically acceptable carrier.

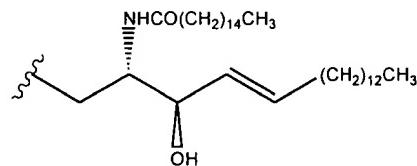
115. The composition of claim 114 wherein the compound is bound to a suitable carrier protein or lipid, said compound being bound either directly or by a cross-linker selected from the group consisting of a succinimide and an M<sub>2</sub> linker.

116. The composition of claim 114 wherein the compound has the structure:

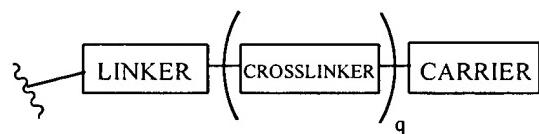


wherein r, m, and n are independently 0, 1, 2 or 3;

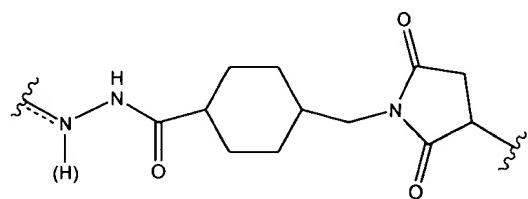
wherein R is H, substituted or unsubstituted alkyl, aryl or allyl, an amino acyl moiety, a moiety having the structure:



or a moiety having the structure:



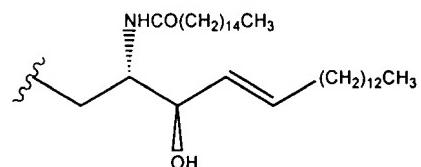
wherein the linker is  $-(CH_2)_s-CH_2-$  or  $-(CH_2)_s-CH=$  where s is an integer between 0 and 8;  
wherein the crosslinker is selected from the group consisting of a succinimide and an M<sub>2</sub> linker having the structure:



wherein q is 0 or 1;

and wherein the carrier is a protein, peptide or lipid, and is optionally chemically modified prior to conjugation with the linker when q is 0, or with the crosslinker when q is 1;

with the proviso that when R is the moiety having the structure:



the set of indices (r, m, n) is not (1, 0, 1).

117. The composition of claim 115 or 116 wherein the protein is bovine serum albumin, polylysine, or keyhole limpet hemocyanin.
118. The composition of claim 114 wherein the immunological adjuvant is bacteria or liposomes.
119. The composition of claim 118 wherein the adjuvant is *Salmonella minnesota* cells, bacille Calmette-Guerin or QS21.